

**WHAT IS CLAIMED IS:**

1. An OLED display system, comprising:
  - a) an OLED display including an array of light emitting pixels,
  - 5 each pixel having a plurality of OLEDs for emitting different colors of light specifying a gamut wherein one of the OLEDs has a power efficiency or lifetime different from the power efficiency or lifetime of at least one of the other OLEDs;
  - b) a control signal; and
  - c) a display driver for receiving a color display signal representing
- 10 a relative luminance and color to be produced for each pixel of the display and generating a converted color display signal for driving the OLEDs in the display, wherein the display driver is responsive to the control signal for controlling the color gamut saturation of light produced by the OLEDs to reduce power consumption or increase lifetime of at least one of the OLEDs.

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2. The OLED display system claimed in claim 1, wherein the control signal is generated by a photosensor responsive to ambient illumination.

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3. The OLED display system claimed in claim 2, wherein the display driver further changes the brightness of the OLED display in response to the ambient illumination level.

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4. The OLED display system claimed in claim 1, wherein the control signal is dependent upon the image content of the color display signal.

5. The OLED display system claimed in claim 1, wherein the control signal is dependent upon the age of the OLED display.

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6. The OLED display system claimed in claim 1, further comprising a portable power source for providing power to the OLED display, and wherein the control signal is dependent upon the power remaining in the portable power source.

7. The OLED display system claimed in claim 1, wherein the display driver includes a damping constant to prevent rapid changes in color gamut saturation of the OLED display.

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8. The OLED display system claimed in claim 1, wherein the display driver changes the color gamut saturation of the OLED display in response to the OLED temperature.

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9. The OLED display system claimed in claim 1, wherein the means for generating a control signal is a user interface control that allows a user to select a tradeoff between power usage and color gamut saturation of the OLED display.

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10. The OLED display system claimed in claim 1, wherein the display driver limits the color gamut saturation of the OLED display within a range having some minimum and/or maximum value.

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11. The OLED display system claimed in claim 1, wherein the OLED display includes OLEDs having different emissive materials that emit different colors of light.

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12. The OLED display system claimed in claim 1, wherein the OLED display includes OLEDs that employ a common emissive material that emits a broad spectrum of light and are overlaid with color filters.

13. The OLED display system claimed in claim 12, wherein the color filters include red, green, and blue.

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14. The OLED display system claimed in claim 1, wherein the plurality of OLEDs includes at least one OLED within the gamut defined by the other OLEDs.

15. The OLED display system claimed in claim 14, wherein the in-gamut OLED emits white light.

5 16. The OLED display system claimed in claim 1, wherein the plurality of OLEDs includes at least one OLED outside the gamut defined by the other OLEDs.

10 17. The OLED display system claimed in claim 16, wherein at least one of the OLEDs emits yellow light.

18. The OLED display system claimed in claim 16, wherein at least one of the OLEDs emits cyan light.

15 19. The OLED display system claimed in claim 16, wherein the plurality of OLEDs includes at least one red, at least one green and at least one blue light emitting OLED, and at least one OLED outside the gamut defined by the red, green and blue light emitting OLEDs which has a power efficiency higher than the power efficiency of at least one of the other OLEDs.

20 20. The OLED display system claimed in claim 16, wherein reduced color gamut saturation of the OLED display is accomplished by increasing the relative brightness of the out-of-gamut OLED.

25 21. The OLED display system claimed in claim 1, wherein one of the OLEDs has a power efficiency greater than the power efficiency of at least one of the other OLEDs, and the display driver is responsive to the control signal for controlling the color gamut saturation of light produced by the OLEDs to reduce power consumption.

30 22. The OLED display system claimed in claim 1, wherein one of the OLEDs has a lifetime longer than the lifetime of at least one of the other

OLEDs, and the display driver is responsive to the control signal for controlling the color gamut saturation of light produced by the OLEDs to increase lifetime of at least one of the other OLEDs.

5                   23. The OLED display system claimed in claim 1, wherein the control signal is generated by a sensor responsive to OLED temperature, and wherein the display driver controls the color-gamut saturation of the converted color display signal in proportion to the OLED temperature.

10                  24. A method of driving an OLED display, comprising the steps of:

15                  a) providing an OLED display including an array of light emitting pixels, each pixel having a plurality of OLEDs for emitting different colors of light specifying a gamut wherein one of the OLEDs has a power efficiency or lifetime different from the power efficiency or lifetime of at least one of the other OLEDs;

20                  b) generating a control signal;

                        c) receiving a color display signal representing a relative luminance and color to be produced for each pixel of the display;

                        d) generating a converted color display signal for controlling the color gamut saturation of light produced by the OLEDs; and

                        e) driving the OLED display with the converted color display signal to reduce power consumption or increase lifetime of at least one of the OLEDs.

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                        25. The method claimed in claim 24, further comprising changing the brightness of the OLED display in response to the ambient illumination level.